We claim:

1. A bifocal contact lens formed of at least one optical material and comprising,
   a back surface of generally concave shape, and
   a front surface of generally convex shape,
   said front surface joining said back surface at an edge perimeter,
   at least one of said surfaces comprising an upper zone of optical power and a lower zone of different optical power, said upper and lower zones connected by a transition,
   a region between said bifocal area and said edge perimeter comprising a peripheral zone,
   said upper zone and said lower zone together with said transition comprising a bifocal area that is monocentric,
   said transition comprising a family of curves with an upper and a lower boundary and having a plurality of sigmoidal shapes,
   whereby said lens provides a wearer with vision that is free of image jump and allows minimal resistance to lid movement across said lens.

2. The lens of claim 1 in which at least one of said boundaries of said transition forms a straight line in plan view.

3. The lens of claim 1 in which at least one of said boundaries of said transition forms a curved line in plan view.

4. The lens of claim 1 in which a midpoint of said transition extends from a geometric center of said lens to said peripheral zone of said lens.

5. The lens of claim 1 in which said midpoint of said transition extends from a position decentered from said geometric center of said lens to said peripheral zone of said lens.

6. The lens of claim 1 in which at least one surface of said upper and lower power zones is selected from the group consisting of spherical, aspherical and toric surfaces.

7. The lens of claim 1 in which at least one of said front and back surfaces has a set of curvatures that correct for aberrations of the eye.

8. The lens of claim 1 comprising prism power in at least a portion of said lens, in addition to optical power.

9. The lens of claim 1 in which at least one of said optical power zones is comprised of at least two optical power zones to form a multifocal contact lens.

10. The lens of claim 1 whereby said sigmoidal curves are based on conic functions.

11. The lens of claim 1 whereby said sigmoidal curves are based on polynomial functions.

12. The lens of claim 1 whereby said sigmoidal curves are based on transendental functions.

13. The lens of claim 1 whereby said sigmoidal curves are based on cumulative distribution functions.

14. A bifocal contact lens formed of at least one optical material and comprising,
a back surface of generally concave shape,
a front surface of generally convex shape,
said front surface joining said back surface at an edge perimeter,
at least one of said surfaces comprising an upper zone of optical power and a lower zone of different optical power, said upper and lower zones connected by a transition,
a region between said bifocal area and said edge perimeter comprising a peripheral zone,
said upper zone and said lower zone together with said transition comprising a bifocal area that is monocentric,
said transition comprising a family of curves with an upper and a lower boundary and slopes that are equal to the slopes of said power zones at said boundary, each curve of said family of curves comprising a portion that rises from its lowest point with increasing positive slope to

an inflection point, whereupon said curve continues to rise with decreasing positive slope until reaching its highest point,

whereby said lens provides a wearer with vision that is free of image jump and said lens allows minimal resistance to lid movement across said lens.

15. A bifocal contact lens formed of at least one optical material and comprising,

a back surface of generally concave shape,

a front surface of generally convex shape,

said front surface joining said back surface at an edge perimeter,

at least one of said surfaces comprising an upper zone of optical power and a lower zone of different optical power, said upper and lower zones connected by a transition,

a region between said bifocal area and said edge perimeter comprising a peripheral zone,

said upper zone and said lower zone together with said transition comprising a bifocal area that is monocentric,

said transition comprising a family of curves which begin at a connection to a positive radius of said lower zone with an inflection, that is followed by a negative radius that increases continuously until reaching a radius of infinity at an inflection of positive slope, which is followed by a positive radius that decreases continuously until reaching said upper zone, where it changes to the radius of the upper zone,

whereby said lens provides a wearer with vision that is free of image jump and said lens allows minimal resistance to lid movement across said lens.

16. A bifocal contact lens formed of at least one optical material and comprising,

a back surface of generally concave shape,

a front surface of generally convex shape,

said front surface joining said back surface at an edge perimeter,

at least one of said surfaces comprising an upper zone of optical power and a lower zone of different optical power, said upper and lower zones connected by a transition,

a region between said bifocal area and said edge perimeter comprising a peripheral zone,

said upper zone and said lower zone together with said transition comprising a bifocal area that is monocentric,

said transition comprising a plurality of curves of a length that is greater than the chord width of a cutting tool surface at the depth used in cutting said transition,

whereby said lens provides a wearer with vision that is free of image jump and said lens allows minimal resistance to lid movement across said lens.

17. A bifocal intraocular lens formed of at least one optical material and comprising,

a back surface of optical power, and

a front surface of optical power,

said front surface joining said back surface at an edge perimeter,

at least one of said surfaces comprising an upper zone of optical power and a lower zone of different optical power, said upper and lower zones connected by a transition,

said upper zone and said lower zone together with said transition comprising a bifocal area that is monocentric,

said region surrounding said bifocal area comprising structures to support said lens in the eye,

said transition comprising a family of curves having a plurality of sigmoidal shapes,

whereby said lens provides a wearer with vision that is free of image jump and provides a lens with smooth surfaces.

18 . A method of manufacturing a monocentric bifocal contact lens in which a computer controlled lathe capable of an oscillating motion of the cutting tool uses a points file to generate the following,

a first surface area about a center of curvature that lies on a predetermined position from the axis of

a second surface area about a center of curvature which is a greater distance from the spindle axis than is said center of curvature of said first optical

power, to form a second optical power zone in the lower portion of said lens,

a transition between said zone of said first optical power and said zone of said second optical power which is defined by a sigmoidal function that is selected so as to produce no change in slope where joining surfaces of said zones of optical power,

whereby said lens provides a wearer with vision that is free of image jump and said lens allows minimal resistance to lid movement across said lens.